

ABSTRACT

This study was motivated by a desire to improve understanding of the sources contributing to the carbon that is an important component of airborne particulate matter (PM). The ultimate goal of this project was to lay a ground work for future tools that might be easily implemented with archived or routinely collected samples. A key feature of this study was application of radiocarbon measurement that can be interpreted to indicate the relative contributions from fossil and non-fossil carbon sources of atmospheric PM. Size-resolved PM and time-resolved PM₁₀ collected from a site in Sacramento, CA in November 2007 (Phase I) and March 2008 (Phase II) were analyzed for radiocarbon and source markers such as levoglucosan, cholesterol, and elemental carbon. Radiocarbon data indicates that the contributions of non-fossil carbon sources were much greater than that from fossil carbon sources in all samples. Radiocarbon and source marker measurements confirm that a greater contribution of non-fossil carbon sources in Phase I samples was highly likely due to residential wood combustion. The present study proves that measurement of radiocarbon and source markers can be readily applied to archived or routinely collected samples for better characterization of PM sources. More accurate source apportionment will support ARB in developing more efficient control strategies.